

**Outline – EM 1110-2-1100 Part VI**  
**757 pages total**

Chapter 1 – Introduction to Coastal Project Element Design – 7 pages

VI-1-1. Introduction to Part VI .....	VI-1-1
VI-1-2. References .....	VI-1-5
VI-1-3. Acknowledgements .....	VI-1-5
VI-1-4. Symbols.....	VI-1-5

Chapter 2 – Types and Functions of Coastal Structures – 64 pages

VI-2-1. Applications .....	VI-2-1
VI-2-2. Typical Cross Sections and Layouts .....	VI-2-8
VI-2-3. Main Types of Concrete Armor Units.....	VI-2-24
VI-2-4. Failure Modes of Typical Structure Types.....	VI-2-26
VI-2-5. References.....	VI-2-55
VI-2-6. Acknowledgments.....	VI-2-56

Chapter 3 – Site Specific Design Conditions – 26 pages

VI-3-1. Foundation/Geotechnical Requirements .....	VI-3-1
VI-3-2. Seasonal Profile Variation.....	VI-3-8
VI-3-3. Flanking Possibility .....	VI-3-9
VI-3-4. Seismic Activity .....	VI-3-10
VI-3-5. Ice .....	VI-3-11
VI-3-6. Environmental Considerations .....	VI-3-14
VI-3-7. Construction Considerations .....	VI-3-15
VI-3-8. Other Design Considerations.....	VI-3-19
VI-3-9. References .....	VI-3-21
VI-3-10. Acknowledgments .....	VI-3-22

Chapter 4 – Materials and Construction Aspects – 73 pages

VI-4-1. Material Requirements .....	VI-4-1
VI-4-2. Earth and Sand.....	VI-4-9
VI-4-3. Stone.....	VI-4-16
VI-4-4. Portland Cement Concrete and Bituminous Concrete.....	VI-4-28
VI-4-5. Steel and Other Metals .....	VI-4-40
VI-4-6. Wood .....	VI-4-47
VI-4-7. Geotextiles and Plastics.....	VI-4-53
VI-4-8. References .....	VI-4-65
VI-4-9. Acknowledgements .....	VI-4-68
VI-4-10. Symbols.....	VI-4-69

Chapter 5 – Fundamentals of Design – 364 pages

VI-5-1.	Introduction.....	VI-5-1
VI-5-2.	Structure Hydraulic Response.....	VI-5-3
VI-5-3.	Rubble-Mound Structure Loading and Response .....	VI-5-59
VI-5-4.	Vertical-Front Structure Loading and Response.....	VI-5-145
VI-5-5.	Foundation Loads .....	VI-5-192
VI-5-6.	Scour and Scour Protection.....	VI-5-252
VI-5-7.	Wave Forces on Slender Cylindrical Piles.....	VI-5-278
VI-5-8.	Other Forces and Interactions .....	VI-5-309
VI-5-9.	References.....	VI-5-320
VI-5-10.	Acknowledgements.....	VI-5-352
VI-5-11.	Symbols .....	VI-5-353

Chapter 6 – Reliability Based Design of Coastal Structures – 56 pages

VI-6-1.	Introduction .....	VI-6-1
VI-6-2.	Failure Modes and Failure Functions .....	VI-6-2
VI-6-3.	Single Failure Modes Probability Analysis.....	VI-6-3
VI-6-4.	Failure Probability Analysis of Failure Mode Systems.....	VI-6-15
VI-6-5.	Parameter Uncertainties in Determining the Reliability of Structures .....	VI-6-22
VI-6-6.	Partial Safety Factor System for Implementing Reliability in Design .....	VI-6-26
VI-6-7.	References .....	VI-6-49
VI-6-8.	Acknowledgments .....	VI-6-50
VI-6-9.	Symbols.....	VI-6-50

Chapter 7 – Example Problems, 93 pages

VI-7-1.	Introduction.....	VI-7-1
VI-7-2.	Wave Runup.....	VI-7-2
VI-7-3.	Wave Overtopping .....	VI-7-21
VI-7-4.	Armor Layer Stability .....	VI-7-29
VI-7-5.	Stability of Vertical Walled Bulkheads and Caissons.....	VI-7-70
VI-7-6.	Forces on Cylindrical Piles .....	VI-7-86
VI-7-7.	References .....	VI-7-89
VI-7-8.	Acknowledgements.....	VI-7-91
VI-7-9.	List of Symbols .....	VI-7-91

Chapter 8 – Monitoring, Maintenance, and Repair of Coastal Projects – 74 pages

VI-8-1.	Maintenance of Coastal Projects .....	VI-8-1
VI-8-2.	Inspecting and Monitoring Coastal Structures .....	VI-8-3
VI-8-3.	Repair and Rehabilitation of Coastal Structures .....	VI-8-37
VI-8-4.	References .....	VI-8-60
VI-8-5.	Acknowledgments.....	VI-8-67
VI-8-6.	Symbols.....	VI-8-67